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SOME CASUAL ELEMENTS IN THE FLORA OF WESTERN MAINE.

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ANY lover of plants, one who is looking for species new to his experience, should, if resident near a woolen mill, carefully watch the waste-heap for species native in those regions forming the source of the wool supply.

For thirteen years, I have had the pleasure of studying the flora of the waste-heap of the North Berwick Manufacturing Company's plant, during which time the factory has used wool from Arizona, California, New Mexico, Texas, Colorado, Utah, Idaho, Oregon, the Middle West, and, in 1892, a few pounds from Australia.

Not many of the "sheep ticks" have adapted themselves to our soil and climate. Perhaps the treatment and use of the wool-waste will somewhat explain this. The waste is heaped into a natural hollow, the outlet of which is closed; for several years, it there collects moisture, is mixed with night-soil, rots, and is finally carted away to form a compost heap before being used for a fertilizer. *Atriplex patulum*, L., var. *littorale*, Gray, *Medicago lupulina*, L., and *Erodium moschatum*, Willd., are the only species seeming to have been introduced in the wool that are at all permanently located here. The first is abundant in waste ground around the storehouses of the factory; the medick is well established in the surrounding grassland; while the heron's-bill is occasionally found around the buildings and along the river-bank below the mill. *Madia glomerata*, Hook., *Hymenatherum aureum*, Gray, *Erodium cicutarium*, L'Hér., and *Helenium nudiflorum*, Nutt., have occurred along the river, the last species remaining several years in grassland, but have

shown no signs of becoming permanent. The Helenium has not been found near the waste-heap, and may have been introduced in grass seed; but I have inclined to the wool theory, because the plants were all found along the line of the principal current when the river is high enough to overflow the intervalles below the mill.

Taken as a whole, the list does not present many plants of a character, in this latitude, to worry the farmer with the fear of new weeds.

For the identification of the majority of the species, I am indebted to Merritt L. Fernald. Thanks are also due Dr. B. L. Robinson, Dr. J. M. Greenman and Prof. F. Lamson Scribner, for their kind assistance in the work of identification.

PLANTS INTRODUCED IN WOOL-WASTE AT NORTH BERWICK, ME.

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| <i>Senebiera pinnatifida</i> , DC. | <i>Veronica peregrina</i> , L. |
| <i>Erodium cicutarium</i> , L'Hér. | <i>Marrubium vulgare</i> , L. |
| <i>E. moschatum</i> , Willd. | <i>Amaranthus retroflexus</i> , L. |
| <i>E. Botrys</i> , Bertolini. | <i>A. hybridus</i> , L. |
| <i>Medicago lupulina</i> , L. | <i>A. graecizans</i> , L. (<i>A. albus</i> , L.). |
| <i>M. arabica</i> , All. (<i>M. maculata</i> , Willd.). | <i>Atriplex patulum</i> , L., var. <i>littorale</i> , Gray. |
| <i>M. hispida</i> , Gaertn. (<i>M. denticulata</i> , Willd.). | <i>Atriplex patulum</i> , L., var. <i>hastatum</i> , Gray. |
| <i>M. laciniata</i> , All. | <i>Chenopodium leptophyllum</i> , Nutt. |
| <i>Glycyrrhiza lepidota</i> , Nutt. | <i>C. olidum</i> , Watson. |
| <i>Aplopappus gracilis</i> , Gray. | <i>C. album</i> , L., var. <i>viride</i> , Moq. |
| <i>Artemisia annua</i> , L. | <i>Monolepis chenopodioides</i> , Moq. |
| <i>A. Ludoviciana</i> , Nutt. | <i>M. trifida</i> , Schrad. |
| <i>Aster frondosus</i> , Torr. & Gray. | <i>Cenchrus tribuloides</i> , L. |
| <i>Bidens aristosa</i> , Britton (<i>Coreopsis</i> , Michx.). | <i>Tragus racemosus</i> , Hall. |
| <i>Cosmos parviflorus</i> , HBK. | <i>Sporobolus interruptus</i> , Vasey. |
| <i>Cotula australis</i> , Hook. f. | <i>S. cryptandrus</i> , Gray. |
| <i>Dysodia chrysanthemoides</i> , Lag. | <i>S. cryptandrus</i> , Gray, var. <i>strictus</i> , Scribn. |
| <i>Helenium nudiflorum</i> , Nutt. | <i>Polypogon Monspeliensis</i> , Desf. |
| <i>Heterospermum pinnatum</i> , Cav. | <i>Deschampsia elongata</i> , Munro. |
| <i>Hymenatherum aureum</i> , Gray. | <i>Chloris cucullata</i> , Bisch. |
| <i>Madia glomerata</i> , Hook. | <i>C. elegans</i> , HBK. |
| <i>Verbesina encelioides</i> , B. & H. | <i>Lycurus phleoides</i> , HBK. |
| <i>Xanthium Canadense</i> , Mill. | <i>Bouteloua Humboldtiana</i> , Griseb. |
| <i>X. spinosum</i> , L. | <i>B. prostrata</i> , Lag. |
| <i>X. strumarium</i> , L. | <i>B. oligostachya</i> , Torr. |
| <i>Echinopspermum Lappula</i> , Lehm. | <i>B. uniflora</i> , Vasey. |
| <i>E. Redowskii</i> , Lehm., var. <i>occidentale</i> , Wats. | <i>Eragrostis major</i> , Host. |
| | <i>E. Neo-mexicanus</i> , Vasey. |

<i>Poa tenuifolia</i> , Buckl.	<i>B. mollis</i> , L.
<i>Puccinellia airoides</i> , Nutt.	<i>B. racemosus</i> , L.
<i>Festuca Myurus</i> , L.	<i>B. racemosus</i> , L., var. <i>commutatus</i> ,
<i>F. tenella</i> , Willd.	Hook. f.
<i>Bromus marginatus</i> , Nees (<i>B.</i>	<i>B. tectorum</i> , L.
<i>breviaristatus</i> , Auct.).	<i>Hordeum jubatum</i> , L.
<i>B. carinatus</i> , H. & A.	<i>H. pratense</i> , Huds.
<i>B. secalinus</i> , L.	<i>Elymus Sitanion</i> , Schultes.

Many other species have grown on the waste-heap, but have not attained sufficient maturity to afford me any help to their identification; probably an expert could have recognized many of them.

Another species that has evidently come to stay is *Chenopodium foetidum*, Schrad. Its introduction may have been through the medium of the wool-waste, or in grass-seed. In the fall of 1900, the intervale where it has occurred was "broken up" and seeded; during the winter and spring of 1901, several heavy rains caused the river to overflow the peninsula formed by the lower end of the intervale, the top soil of which was scraped away by the ice, which was driven across it, instead of being carried around in the channel of the river. Hardly anything besides *Barbarea vulgaris*, R. Br., and *Asclepias Cornuti*, Dec., appeared that season, the ground lying fallow throughout the year. In the spring of 1902, the field was plowed, remanured (by which means the seed may have been brought in, the dressing coming partly from a stable where baled hay had been fed) and planted to potatoes and corn. In August and September of this year, I found a considerable quantity of the *Chenopodium* among the potatoes, but none among the corn. In 1903, the field was planted to the same crops, and the weed was abundant in all parts of the field. I would suggest that some appreciative botanist change the specific name from *foetidum* to *fragrans*, as I consider the odor pleasing.

Newly seeded fields, especially those seeded without grain in the fall, have always been among my favorite hunting grounds. In one, about ten years ago, I found *Berteroa incana*, DC., *Camelina microcarpa*, Andrz., *Sisymbrium altissimum*, L., *Thlaspi arvense*, L., *Viola arvensis*, Murr., *Silene Cucubalus*, Wibel., *S. noctiflora*, L., *S. dichotoma*, Ehrh., *Stellaria graminea*, L., *Medicago sativa*, L., *Melilotus alba*, Desr., *M. officinalis*, Lam. *Heliopsis scabra*, Dunal., *Echium vulgare*, L., *Narcissus poeticus*, L., and *Ornithogalum umbellatum*, L., the last two being, of course, garden escapes. The greater number of these have fallen asleep, but *Heliopsis*, *Narcissus* and *Ornithogalum* remain unto this day.

In 1902, another field of fall-seeding gave me the following species:— *Ranunculus micranthus*, Nutt., *Arabis perfoliata*, Lam., *Barbarea stricta*, Andrz., *Brassica juncea*, Cosson, *Camelina microcarpa*, Andrz., *Cardamine parviflora*, L., *Erysimum cheiranthoides*, L., *Sisymbrium canescens*, Nutt., *S. Sophia*, L., *Arenaria serpyllifolia*, L., *Saponaria Vaccaria*, L., *Silene antirrhina*, L., a form somewhat pubescent and with flowers fully open after sunset! *Erodium cicutarium*, L'Hér., *E. moschatum*, Willd., *Lotus arabicus*, L.?, *Artemisia Ludoviciana*, Nutt., *Specularia perfoliata*, A. DC., *Gilia linearis*, Gray, *Echinosperrum Redowskii*, Lehm., var. *occidentale*, Watson, *Myosotis verna*, Nutt., *Veronica arvensis*, L., *V. peregrina*, L., *Marrubium vulgare*, L., *Plantago Purshii*, R. & S. (*P. gnaphaloides*, Nutt.), *Apera Spica-venti*, Beauv., *Bromus marginatus*, Nees. As this field is on an intervalle below the woolen factory and is overflowed every year, some of the above list were probably deposited there in waste that was washed down in a period of high water.

Eleven years ago, a pickle factory in this village was demolished and the brine in the vats was turned upon the ground, thereby saturating the soil with salt. In 1898 there sprang up a dense carpet of *Spergularia salina*, J. & C. Presl., with a border of a bushy form of *Polygonum aviculare*, L., and a colony of three plants of *Heliotropium Curassavicum*, L.!

While teaching at Rumford Center, Me., fifteen years ago, I was greatly interested in the circumstances attending the appearance and disappearance of *Euphorbia glyptosperma*, Engel. At that time there was a steam saw-mill on the outskirts of the village, and the method of moving logs from the yard to the slip was by hitching a chain around one end of a log and "snaking" it, as they aptly called the performance, to its destination. This kind of work tore up the sod, making furrow-like places all over the yard. During the summer, in these furrows, grew a profusion of the Euphorbia; the next year none could be found. Whence came it? Whither did it go?

NORTH BERWICK, MAINE.